Attachment H

Proposal # 2001- E 2/2 (Office Use Only)

PSP Cover Sheet (Attach to the front of eachproposal)

Proposal Title: Ecological Monitoring of Tolay and Cullinan Ranch Tidal Wetland Restoration...
Applicant Name: Ducks Unlimited, Inc.
Contact Name: Fritz Reid, Ph.D.
Mailing Address: 3074 Gold Canal Drive, Rancho Cordova, CA 95670
Telephone: (916) 852-2000
Fax: (916) 854-2200
Email: Freid@ducks.org

Amount offundingrequested: $ 593, 931
Some entities charge different costs dependent on the **source** of the funds. If it is different for state or federal funds list below.
State cost _____ Federal cost _____

Cost share partners? X **Yes** ____ **No**
Identify partners and amount contributed by each U. S. Geological Survey Biological Research Division- $54,300

Indicate the Topic for which you are applying (check only one box).

- ☐ Natural Fiow Regimes
- ☐ .Nonnative invasive Species
- ☐ Channel Dynamics/Sediment Transport
- ☐ Flood Management
- ☒ Shallow Water Tidal/ Marsh Habitat
- ☐ Contaminants
- ☐ Beyond the Riparian Corridor
- ☐ Local Watershed Stewardship
- ☐ Environmentai Education
- ☐ Special Status Species Surveys and Studies
- ☐ Fishery Monitoring, Assessment and Research
- ☐ Fish Screens

What county or counties is the project located in? NAPA, SOLANO & SONOMA COUNTIES

What CALFED ecozone is the project located in? See attached list and indicate number. Be as specific as possible Suisun Marsh/San Francisco Bay–San Pablo Bay

Indicate the type of applicant (check only one box):

- ☐ State agency
- ☐ Federal agency
- ☐ Public/Non-profit joint venture
- ☒ Non-profit
- ☐ Local government/district
- ☐ Tribes
- ☐ University
- ☐ Private **party**
- ☐ Other: _____

Indicate the primary species which the proposal addresses (check all that apply):

- ☐ San Joaquin and East-side Delta tributaries fall-run chinook salmon
- ☐ Winter-run chinook salmon
- ☐ Spring-run chinook salmon
- ☐ Late-fall run chinook salmon
- ☐ Fall-run chinook salmon
- ☒ Delta smelt
- ☐ Longfin smelt
- ☒ Splittail
- ☐ Steelhead trout
- ☐ Green sturgeon
- ☐ Striped bass
- ☐ White Sturgeon
- ☒ All chinook species
- ☒ Waterfowl and Sliorebirds
- ☒ All anadromous salmonids
- ☒ Migratory birds
- ☐ American shad
- ☐ Other listed T/E species: Salt Marsh Harvest Mouse, California Clapper Rail

Indicate the type of project (check only one box):

- ☒ Research/Monitoring
- ☐ Watershed Planning
- ☐ Pilot/Demo Project
- ☐ Education
- ☐ Full-scale Implementation

Is this a next-phase of an ongoing project? Yes _x_ No____

Have you received funding from CALFED before? Yes _x_ No ——

If yes, list project title and CALFED number Toley Creek FI-326; Cullinan Ranch FI-327

Have you received funding from CVPIA before? Yes ____ No____

If yes, list CVPIA program providing funding, prbject title and CVPIA number (if applicable):

By signing below, the applicant declares the following:

- The truthfulness of all representations in their proposal;
- The individual signing the form is entitled to submit the application on behalf of the applicant (if the applicant is an entity or organization); and
- The person submitting the application has read and understood the conflict of interest and confidentiality discussion in the PSP (Section 2.4) and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent as provided in the Section.

Ronald A. Stoomstad

Printed name of applicant

Signature of applicant

EXECUTIVE **SUMMARY**

Ecological Monitoring **of** the Tolay Creek and Cullinan Ranch
Tidal Wetland Restoration Projects in the **North** San Francisco Bay

The restoration of wetlands in the San Francisco Bay-Delta is an objective of the CALFED Bay-Delta Program Estuary Restoration Program Plan (ERPP). Habitat restoration is a priority in the ERPP as a means to facilitate recovery of populations of threatened and endangered species. The 176-ha Tolay Creek and 606-ha Cullinan Ranch restoration projects currently underway at the San Pablo Bay National Wildlife Refuge will increase the availability and abundance of tidal habitat available for salt marsh species. The Tolay Creek project is directed at improving water circulation and salt marsh development along a creek constricted from sedimentation. The Cullinan Ranch project will restore a diked farmland parcel back to tidal salt marsh. Restoration of tidal wetlands in these North Bay projects will provide more saline emergent habitat for endangered species including the California Clapper Rail and the Salt Marsh Harvest Mouse.

This CALFED proposal comprises the Next Phase of the Tolay Creek and Cullinan Ranch restoration projects, previously funded through the construction phase. Our objective is to monitor these *two* projects through the transition from project construction to the development of tidal salt marsh. By monitoring a broad base of variables (including sedimentation, hydrology, water quality, vegetation, invertebrates, fish, birds and small mammals) we will increase the understanding of how physical and biological processes work together in Tidal Wetland Restoration, a Scientific Uncertainty named in the 2001 Implementation Plan. We will test four hypotheses that predict specific outcomes from habitat conditions that occur during the transition from diked wetland to tidal salt marsh habitat. The proposed project will contribute to the following ERP Goals: At-Risk Species, Ecosystem Processes and Biotic Communities, Habitats and Non-native Invasive Species.

In addition, the proposed monitoring plan is part of an adaptive approach to the management of *two* large-scale restoration projects. Monitoring and subsequent evaluation of the Tolay Creek and Cullinan Ranch projects is critical so that management strategies can be adjusted to cope with changing conditions. Ecological monitoring of wetland projects is a crucial step in restoration which was identified by the CALFED Bay-Delta Program (Ecosystem Restoration Projects and Programs). Qualified personnel are in place to continue the post-construction monitoring at Tolay Creek, and to begin the similar monitoring at Cullinan Ranch.

Dr. Fritz Reid of Ducks Unlimited, Inc. (phone: 916.852.2000, fax: 916.852.2200, email: freid@ducks.org), Dr. John Y. Takekawa, of the U.S. Geological Survey, Biological Resources Division, Western Ecological Research Center, San Francisco Bay Estuary Field Station, and Dr. Michael A. Bias of ECORP Consulting, Inc. are requesting $593,931 to fund the ecological monitoring of the Tolay Creek and Cullinan Ranch tidal wetland restoration projects for three years. Cooperators in the projects include the San Pablo Bay National Wildlife Refuge, the California Department of Fish and Game, Napa Sonoma Marshes Wildlife Area, and the California Department of Transportation.

PROJECT DESCRIPTION

The U.S. Fish and Wildlife Service (USFWS) manages 5,700 ha with an additional 2,800 ha approved for acquisition in San Pablo Bay; many of these areas are historic salt marshes that were diked and drained for agriculture that will be restored to tidal marsh. The USFWS hopes to increase the populations of listed or candidate species that occur in salt marsh habitat. Numerous special-status species would benefit from such restoration projects in the region, including California clapper rail (*Rallus longirostris),* California black rail (*Laterallus jamaicensis coturniculus),* Suisun song sparrow (*Melospiza melodia samuelis),* salt marsh harvest mouse *(Reithrodontomys raviventris)* and Suisun shrew *(Sorex ornatus sinuosus).* Several fish species would also benefit fiom increased salt marsh habitat, including Delta smelt *(Hypomesus transpacificus),* Sacramento splittail *(Pogonichthys macrolepidotus),* and tidewater goby *(Eucyclogobius newberryi),* Chinook salmon *(Oncorhynchus tshawytscha),* steelhead trout *(Oncorhynchus mykiss),* green sturgeon *(Acipenser medirostris),* and longfin smelt *(Spirinichus thaleichthys).* Rare plant species that would benefit from restoration actions include soft bird's beak *(Cordylanthus mollis ssp. mollis),* Delta tule pea *(Lathyrus jepsonii ssp. jepsonii),* and Mason's lilaeopsis *(Lilaeopsis masonii),* among others.

Two tidal wetland restoration projects, Cullinan Ranch (606 ha) and Tolay Creek (176 ha), are currently underway in the North Bay (Figure 1). The San Pablo Bay National Wildlife Refuge is cooperating with several local partners (including California Department of Fish and Game, Ducks Unlimited, Southern Sonoma County Resource Conservation District, Save San Francisco Bay Association, and the City of Vallejo). Both projects were partially-funded through construction by CALFED in 1998 (Tolay Creek #1998FI-326 and Cullinan Ranch #1998FI-327). However, funding has not been secured to fully implement the post-construction monitoring plan for either project.

The implementation of a broad-based, ecological monitoring program is essential to the success of large-scale tidal wetland restoration projects, for two main reasons. First, monitoring of such projects provides basic information about the processes behind Tidal Wetland Restoration (one of the Scientific Uncertainties listed in CALFED's 2001 *Proposal Solicitation Package).* Most restoration projects are based on the underlying assumption that changes in physical conditions (restored tidal flow, increased sedimentation, enhanced water quality) will encourage the development of the biological features of tidal wetland ecosystems (vegetation, invertebrate communities, fish, birds and mammals) and will result in a stable and fully-functioning ecosystem. Documentation of pre-and post-construction stages of restoration projects ensures that as much information as possible is gathered fiom the process.

Ecological monitoring also facilitates an adaptive approach to the management of tidal restoration projects. Several large-scale restoration projects have been conducted in California over the past twenty years (Josselyn 1982, Zedler 1996, BCDC 1988, San Francisco Bay Joint Venture Implementation Plan 1999, Goals Project 1999). **An** adaptive management approach, complete with a detailed and peer-reviewed monitoring plan to assess a restoration effort's progress, has proven critical to a project's success (Zedler 1996). The adaptive approach is most effective for meeting the objectives of tidal restoration projects, since it allows an adjustment of management strategy if the habitat is not developing as expected. For example, at Tolay Creek,

initial water levels exceeded expectations immediately following the December 1998 construction, resulting in the need for corrective action. We installed tidal dataloggers in the lower, mid, and upper reaches of the project to examine tidal cycles. Low tides were elevated in the upper section, suggesting that flow was constricted. A channel was dredged through the lower lagoon in February 1999, and subsequent tidal datum showed improvement.

We propose to continue the monitoring program at Tolay Creek and to begin a similar program at Culliian Ranch immediately following construction. It is essential that we document the physical and biological changes occurring immediately after construction at Cullinan Ranch, and during the first few critical years at Tolay Creek. Broad-based physical and biological monitoring of these two restoration projects will 1) result in a substantial contribution to our understanding of the processes behind Tidal Wetland Restoration (one of CALFED's Scientific Uncertainties) by documenting changes in habitat type and function as the restoration process continues, and 2) facilitate an adaptive management strategy to ensure that these particular projects result in stable, fully-functional tidal salt marsh habitat.

Conceptual Model

Most tidal wetland restoration projects are based on the assumption that if the appropriate physical conditions are in place, then the biological attributes of a tidal salt marsh will return as a consequence **(PSP** 2001, Josselyn 1982, Zedler 1996). The Tolay Creek and Cullinan Ranch projects are also based on this conceptual model of tidal wetland restoration (Figure **3).** Initially, tidal influence is restored to a diked area by breaching a levee. Often, there is an elevational difference between the restoration area and the water source due to subsidence, and the project area is flooded and converted to open water habitat. Gradually sedimentation occurs, and historical tidal channels begin to re-form. Sloughs, mud flats and vegetated areas develop. Emergent marsh vegetation colonizes the area from nearby source locations, or restoration plantings. Invertebrate communities colonize the benthos and vegetation. Wildlife use of sloughs and vegetated areas increases. Adult fish inhabit the channels, while juveniles take refuge in the vegetated shallows.

Scientific uncertainties exist at several points in the progression from diked wetlands to tidal marsh. Will restoring tidal flow to previously diked wetlands reinstate historical hydrological characteristics? Will changed hydrology result in the proper sedimentation and water quality changes to promote tidal marsh formation? Will the vegetation change as expected due to increased salinity and inundation? Assuming the anticipated vegetation communities develop, will populations of targeted wildlife-species increase as a result?

Monitoring a broad range of physical and biological variables before and after project construction will substantially improve our knowledge in these areas of uncertainty. For example, Tolay Creek, restored to tidal action during December of 1998, has already seen an increase in bird use, and favorable response in vegetation formation and use by fish. The levees at Cullinan are still in place, but removal of the rainwater pump has already changed the biology of the site. Documenting the physical changes immediately following levee removal at Cullinan Ranch will be critical to understanding the biological response. Changes in both the physical (tidal flow, sediments, and water quality) and biological (vegetation, invertebrates, fish, birds,

small mammals) components of each ecosystem must be documented so that we can better understand the connection between the two.

Hypotheses

The proposed monitoring program will address four hypotheses:

1. Restoring tidal flow to previously diked wetlands will change hydrological factors.
   Tide range and **flow** will be monitored to evaluate changes of tidal datum over time.

2. Changed hydrology will change biophysical parameters,
   Sediment accretion and water quality will be monitored to evaluate sedimentation and water quality changes over time.

3. Plant communities will change due to increased salinity and inundation.
   Plant species richness, density and cover will be monitored to evaluate changes in diversity and community structure over time.

4. Changes in plant communities, cover and habitat will favor increased populations **of** targeted endangered species.
   Populations of birds, mammals, fish and invertebrates, including endangered species, will be monitored to evaluate changes in presence/absence and population numbers over time.

The goals of *the* CALFED Ecosystem Restoration Plan (ERP) are based on the assumption that the "rehabilitation of the appropriate physical-chemical habitat in priority locations will carry with it recovery of sustainable populations of species of concern" (p.34, PSP). The above hypotheses directly address the limiting factors of Shallow Water, Tidal and Freshwater Marsh Habitat (in this case Tidal), one of the scientific uncertainties named in the 2001 Implementation Plan.

Implementation of the ecological monitoring program for the Tolay Creek and Cullinan Ranch restoration projects will test this assumption. Instead of following changes over time in one ecosystem component or one target species population, the proposed monitoring program will document change in a broad range of physical and biological parameters. These include sedimentation, hydrology, water quality, vegetation, invertebrates, fish, mammals and birds. By quantifying different components of the restored ecosystem simultaneously, we will be able to statistically test for correlative relationships between estimates of multiple at-risk species population densities and potentially limiting physical and biological factors. This will increase our understanding of the relationships between different tidal marsh ecosystem components in the San Pablo Bay region.

Adaptive Management

The purpose of the proposed monitoring project is to document changes in biological, chemical, and physical factors before and after restoration, and through time as the wetland restoration progresses. Such monitoring is an integral part of an Adaptive Management Approach to wetland restoration (Zedler 1996). By implementing the proposed monitoring program, we will be able to simultaneously increase our knowledge of physical and biological ecosystem processes while ensuring that the restoration objectives for each project are achieved. The proposed project is located at Step 5 of the Chapter III Adaptive Management Design (p. 15, PSP). We feel that it is critical to the success of the Tolay Creek and Cullinan Ranch projects that the post-construction monitoring plan be fully implemented. Through monitoring, we will be able to Assess, Evaluate, and Adapt (Step 6) ow management strategy if necessary; to revise our objectives, redefine ow conceptual model, or continue with restoration actions as planned. Without monitoring, all of the potential information that these two large-scale habitat restoration projects are certain to yield will be lost.

The San Pablo Bay National Wildlife Refuge has not developed specific numerical goals for the increase of populations of listed or candidate species that occur in salt marsh habitat. We share the view that very specific numbers (i.e. **2.5** California Clapper Rails or 10% increase in pickleweed plants) are not warranted given the current lack of knowledge about the long-term results of these types of wetland rehabilitations. Instead, we will document all increases or decreases in populations through comparisons with baseline data and prior surveys, and associate them with relationships among other variables. For example, a hypothetical situation might include documenting an increase in salt marsh harvest mice, which is correlated with decreased open water and increased pickleweed density. Thus, the monitoring will provide information on presence or absence of desired species, increasing trends in their population numbers, and changes in overall biomass. If increases are not detected or if some desired populations decline, the adaptive management approach will allow for changes in the project, including changing levee breaches or dredging areas to improve channel development.

PROPOSED SCOPE OF WORK

Project Location

Two San Pablo Bay National Wildlife Refuge units will be examined in this study plan. The 176-ha Tolay Creek restoration site (Figure 3) is located 16 km west of Vallejo south of Highway 37 (Lat. 38° 07"30' N, Long. 122° 27"30' W), in Sonoma and Solano Counties. The 606-ha Cullinan Ranch restoration site (Figure 4), is located 6 km west of Vallejo, California on the northern edge of San Pablo Bay, north of Highway 37 (Lat. 38" 07"30' N, Long. 122° 20"00' W), in Solano and Napa Counties.

Approach

To support an adaptive management strategy for the Tolay Creek and Cullinan Ranch restoration projects, changes in marsh development will be characterized at each site as the restoration progresses. Broad-based monitoring of physical and biological parameters will also provide

valuable information on wetland restoration ecological processes. Monitoring will be conducted in both *dry* (May-Oct) and wet (Nov-Apr) seasons. Since slough channels are expected to be primary habitats for fish and wildlife species, each refuge unit will be stratified into marsh plain and slough channel habitat types as they develop.

Biological monitoring samples at Tolay Creek will overlay the 9 established cross-sectional transects from the bay edge to Highway 37 used for examining hydrologic changes. Since Tolay Creek is a restoration project of an existing marsh, established transects along the creek will be sampled repeatedly. In the case of the Cullinan Ranch project, the area will be restored from farmland to tidal marsh, and all data will be gathered within a spatial framework with samples taken at varying intensity within grid systems. Samples at the Cullinan Ranch will **vary** in scale from 250,500, to 1,000 square meter plots within Universal Transverse Mercator (UTM) blocks or approximately 200, 60, or 13 samples respectively, depending on the variable being sampled. All sample locations will be georeferenced to the nearest meter in a horizontal plane with a global positioning system (GPS) and all data will be entered into GIS coverages. Aerial photographs will be taken annually to document large-scale habitat changes.

As the restoration project progresses, data will be collected annually to monitor characteristics of marsh development for the first 3 years. After the first *3* years the characteristics will be monitored biannually up to 10 years, then subsequently every 5 years. Time to completion of restoration projects varies depending on many factors (Zedler 1996). **An** estimate for time to completion for Tolay Creek would be 10 -15 years, and for Cullinan Ranch the process may take 25 - SO years.

Task 1. Physical measurements. We will monitor physical conditions including sedimentation, hydrology and water quality to determine if physical processes are developing as expected. This task addresses our first and second hypotheses (see ***Hypotheses).***

Subtask 1.1. Sediments. Sedimentation pins will be established across the units to examine the rate of sedimentation or change in each unit seasonally. The sediment pins will be positioned to accurately reflect changes in accretion levels (1 cm) over the restoration areas. Our initial estimated sample number is 12 for Tolay Creek (near each transect, each pond, and at the entrance), and 60 for the Cullinan Ranch (every 500 m grid). In addition, annual ground surveys will be conducted annually with GPS survey equipment to verify elevational changes within 0.1 m *(250* m^2 plots, Cullinan Ranch; all transects, Tolay Creek)

Subtask 1.2. Hydrology. Tidal datum reckoning will be used to examine changes in tidal levels. Water be monitored continually with water level data loggers placed at 5 (Tolay Creek) to 15 (Cullinan Ranch) sites throughout the project to examine the water depth (0.5 cm) and flow rates (m/s). Water level, flow, and tidal datum will be monitored each month or season depending on the rate of change during the project to evaluate water distribution and tidal datum.

Subtask 1.3. Water Quality. Total hardness, temperature, pH, turbidity, salinity, and dissolved oxygen will be determined on site from integrated water column samples taken at each plot in the slough channels. These samples will be taken at high tide in conjunction with other seasonal monitoring on each 250 m^2 plot and each transect seasonally. Water samples will be taken and

for water quality during each of the first **3** years of the restoration project and every 2 years thereafter. Samples will be collected during both winter and summer seasons at each study plot in the slough channels.

Task **2.** Biological Measurements. We will measure biological variables, including vegetation, invertebrates and insects, fish, birds and small mammals, to determine if they are responding to changed physical conditions. This task addresses our third and fourth hypotheses (see ***Hypotheses).***

Subtask **2.1.** Vegetation. A 15-m transect will be established from the center of each transect or 250 m^2 plot in a random direction to determine the composition (percent occurrence) of plant species. A 0.5 m^2 grid will be examined at **5** m intervals of transects to estimate mean stem density, height, and percent cover of plants. Plant sampling will be conducted seasonally. As the total area of slough channels and upland types changes as the project proceeds, plots or transects may be added to sample developing slough channels. The extent of the vegetation will be mapped to coverages from low-level aerial photographs imagery taken in the summer, georegistered and digitized annually.

Subtask **2.2.** Invertebrates **&** Insects. One or more core samples (10 cm diameter, 10 cm depth) will be taken to enumerate benthic invertebrates at sampling transects at Tolay Creek or within 500 m^2 plots in the Cullinan Ranch. Samples will be screened (0.5 mm) and frozen prior to sorting. The invertebrates will be identified to order or family, counted, dried, and weighed to the nearest 0.1 mg. With time and funds permitting, insects will be sampled at the center of each 500 m^2 grid plot. A 0.5 m^2 quadrat will be placed at the center of the plot and three passes through the quadrat, each successively deeper, are made with the collection device. Collected insects are then placed in alcohol and frozen prior to sorting. Any insects collected will be identified to family or order, counted, dried, and weighed to the nearest 0.1 mg. Invertebrate sampling will follow the initial study design on a annual basis for the first **3** years followed by sampling every 2 years. The scope of sampling may be expanded after restoration is initiated to examine colonization of newly inundated areas and developing slough systems (500 m^2 plots, Cullinan Ranch; all transects, Tolay Creek). Insect sampling, funds and time permitting, will be conducted once during the first year followed by sampling every **4** years.

Subtask **2.3. Fish.** Fish species assemblages will be surveyed seasonally from sample sites or transects. Multiple gear types will be used to assess the distribution and relative abundance of juvenile and adult. **As** a minimum, throw nets and experimental (variable mesh) gill nets will be fished at all sites. At sites that can be waded, fish will also be sampled with bag seines. Fishing effort for each gear type will be standardized and replicated to allow for statistical comparisons of fish catch among dates and sites. At each site, captured fish will be identified to species and counted, then the first 25 individuals of each species will be measured for total length and weight. In addition, as many as 25 individuals from selected species may be fixed in 10% formalin for subsequent analysis of gut contents to determine their use of invertebrates. If project personnel cannot identify fish (or fish-forage organisms), voucher specimens will be submitted to taxonomic specialists for positive identification. Surveys will be conducted annually for the first **3** years to examine changes in abundance and species diversity, followed by sampling every 2 years.

Subtask 2.4. Birds. Variable circular plots (DeSante 1981) will be used to sample birds in summer and winter at the center of each sample plot. The plots will be sampled from 0.5 - 3.0 h after sunrise with a settling period of 2 minutes followed by a survey period of 8 minutes. Species and distance from the plot center will be recorded. Variable line transect statistics adjusted for circular plot areas (Roeder et al.1987) will be calculated from program DISTANCE to estimate seasonal densities of common species. If numbers of certain species are inadequate to produce density estimates, an index of average number of birds per plot will be reported. Playback recordings will be tested on a subsample of plots to augment surveys and improve counts of secretive rail species (Evens et al. 1991, Marion et al. 1981). Counts and location of larger species (waterfowl, shorebirds) will be completed during a single census of each site in each season, supplemented by aerial surveys of larger species. Surveys will be conducted biannually the first **3** years to examine changes in bird abundance and species diversity. Call count surveys will be added to examine Rallidae populations as the restoration proceeds. After the first **3** years, bird populations will be monitored annually up to 10 years, then subsequently every *5* years.

Subtask 2.5. Mammals. Small mammal work will be conducted from grids in 1 km^2 blocks (Cullinan Ranch) or along transects (Tolay Creek). **A** rectangular capture grid with Sherman live traps will be placed at or near the center of each plot. Traps will be baited each evening within **3** hours of sunset and checked during **3** consecutive mornings within **3** hours of sunrise) once during summer and winter seasons. Mark-recapture analyses (White et al. 1982: Program CAPTURE) will be used to estimate small mammal densities or an index of catch per trap night will be reported. Traps will be provided with extra food and cotton insulation, and individuals which are inadvertently injured during trapping will be euthanized with humane methods of carbon dioxide asphyxiation (Custer and Franson 1988) or cervical dislocation. Mammal trapping will be conducted on an annual basis in plots that are not inundated during the first three years. If initial samples provide inadequate numbers to estimate densities, the number of grids or traps at **a** location may be increased.

Statistical Analyses

Statistical analyses are difficult in this type of project because the experimental unit is the entire parcel. However, we are examining the restoration spatially and since there is great variability, we will define plots or transects as replicate measures. Surveys through time will be treated as repeated measures to examine temporal changes (Hand and Taylor 1987). At the simplest level, presence or absence of a species at a plot or transect may be examined with a chi-squared test to compare it with previous surveys. More specific numerical trends will be examined with repeated measures analysis of variance tests or time-series regression analyses (Johnson and Wichern 1998, Zar 1996). Time-series regression may be required to relate rapidly changing variables (e.g. sediment) with variables changing at a slower rate (e.g. California Clapper Rails). Multivariate analysis of variance tests or multiple regression will be used to relate changes in desired populations with other variables.

Monitoring and Assessment Plans

The proposed project will consist of the implementation of the monitoring plan for *two* projects previously funded by CALFED (Tolay Creek #1998FI326, Cullinan Ranch #1998FI327). Information will be used to evaluate the success of the restoration projects. If necessary, we will adapt our management strategy to achieve project objectives.

Data Handling and Storage

All data will be incorporated into an existing Geographical Information System (GIS) for spatial analysis and storage. Current coverages include digital (raster) images of each site, section boundaries and sampling locations, and data collected during pre-construction monitoring. All post-construction monitoring data will be entered into new coverages for spatial analysis and overlays. The GIS will be housed at U.S.G.S., Biological Resources Division, San Francisco Estuary Field Station, and made available to CALFED for use in future investigations.

Expected Products and Outcomes

The proposed project will result in an increased understanding of tidal wetland restoration processes in San Pablo Bay. A Geographic Information System (GIS) will be developed and used for spatial data analysis and information queries. Annual and quarterly progress reports will be made to CALFED, describing the work completed and an assessment of the project's success at that time. These reports will include summaries of the most recent project results. **A** final report will be produced at the end of the three-year funding period, summarizing all results. We anticipate presentations of results at future scientific meetings, and to CALFED staff.

Work Schedule

The proposed work schedule is presented in Table 1 (see ***Approach*** for more detail on each subtask). Most variables will be sampled on an annual or biannual (wet and dry season) basis. Sedimentation and hydrological trends will be evaluated at least every other month. Ground-truthing of elevation surveys will be conducted as needed. The tasks should not be funded separately. Project management will be an on-going task, with weekly meetings between principle investigators and technical staff to ensure that monitoring activities are on schedule and within budget. Quarterly, annual and a final report will be submitted to CALFED. Principle investigators will be in regular communication with project partners, to solicit their input.

Feasibility

The project is fully implementable with all applicable permits obtained through the U.S. Fish and Wildlife Service and California Department of Fish and Game held by the Biological Resources Division of the U.S. Geological Survey. As this is an on-going monitoring program, qualified personnel familiar with survey techniques are already in place and access to each site has been granted. The principal investigators in this project have previously conducted projects of this magnitude and scope in a timely and professional manner. No constraints on the successful and timely completion of this project are anticipated.

APPLICATION TO CALFED ERP GOALS AND IMPLEMENTATION PLAN

Applicable Ecosystem Restoration Plan (ERP) Goals

The primary focus of the Tolay Creek and Cullinan Ranch tidal wetland restoration projects, as part of the San Pablo Bay National Wildlife Refuge, is to enhance populations of listed and candidate species through restoration of historic salt marsh habitat. Critical population and habitat use information about At-Risk Species (EW Goal 1) will result from the proposed monitoring project. Such 'special-status' species that are likely to benefit from increased salt marsh habitat include the listed California clapper rail *(Rallus longirostris)* and California black rail *(Laterallusjamaicensis coturniculus)*, Suisun song sparrow *(Melospiza melodia samuelis)*, salt marsh harvest mouse *(Reitkrodontomys raviventris)* and Suisun shrew *(Sorex ornatus sinuosus)*. Cullinan Ranch in particular represents a large block (606 ha) of marsh habitat with tidal circulation, which would greatly benefit the above species. Numerous waterfowl and shorebirds are already using the pickleweed marsh, slough and mudflat habitats at Tolay Creek and will most likely use those habitats that will develop at Cullinan Ranch. Fish species that will benefit from increased amount of tidal wetland habitats include Delta smelt *(Hypomesus transpacificus)*, Sacramento splittail *(Pogonichthys macrolepidotus)*, and tidewater goby *(Eucyclogobius newberryi)*, Chinook salmon *(Oncorhynckus tshawytscha)*, steelhead trout *(Oncorhynckus mykiss)*, green sturgeon *(Acipenser medirostris)*, longfin smelt *(Spirinichus thaleichthys)*. Rare plant species that would benefit fiom restoration actions include soft bird's beak *(Cordylanthus mollis* ***ssp.*** *mollis)*, Delta tule pea *(Lathyrus jepsonii* ***ssp.*** *jepsonii)*, and Mason's lilaeopsis *(Lilaeopsis masonii)*, among others.

This project will also increase knowledge of Ecosystem Processes and Biotic Communities (EW Goal 2). More information on the correlation of physical and biotic variables will result in an increased understanding of the life history and species needs relative to inundation water depth and salinity in tidal wetland regimes required by key native or non-native wetland species. Though not a direct test of the causal relationship between habitat and any particular species, the proposed monitoring will document the large-scale, overall changes in marsh development. Through correlative statistical analyses, we will identify some of the potentially limiting factors that determine the distribution and abundance of selected wetland species of concern for various inundation and salinity regimes.

The proposed monitoring project will reveal more information about critical habitats (EW Goal 4), including pickleweed and other emergent tidal marsh, slough channels, mudflats and open water habitat. The San Francisco Bay-Delta is a critical resource for endemic fish, wildlife, and plant species as well as a major wintering area for migratory waterbirds on the Pacific Flyway. Two-thirds of the remaining salt marsh ecosystems and tidal flat habitats on the Pacific coast are located in the estuary. The North Bay region, including San Pablo and Suisun Bay, comprise the largest remaining contiguous expanse of undeveloped baylands, and several wetland restoration projects are currently underway or proposed for these areas.

A major concern is that restored habitat will be successfully colonized by non-native rather than native species. Part of monitoring the colonization of the Tolay Creek and Cullinan Ranch

projects will be the monitoring of Non-native Invasive Species (Goal 5) populations. Densities of invasive species including Smooth Cordgrass (*Spartina alterniflora*) and Perennial Pepperweed *(Lepidium latifolium)*, as well as invertebrates such as Asiatic clam *(Potamocorbulu amurensis)* and Chinese mitten crab *(Eriocheir sinensis)*, will be correlated with physical and biological variables. This monitoring plan will follow the colonization of both native and non-native species, and, if possible, allow for an adjustment in management strategy before the non-natives become established.

Relationship to other Ecosystem Restoration Projects

This project is linked directly to previous CALFED funding for the Tolay Creek and Cullinan Ranch projects granted to Ducks Unlimited (Michael A. Bias, Ph.D., project manager). The construction phase of the Tolay Creek project has been completed as well as pre-project monitoring. Post-project monitoring is being conducted as the site transitions from non-tidal to tidal. Construction is expected to begin this year for the Cullinan Ranch project. Pre-construction monitoring has already been completed.

In addition, Tolay Creek lies immediately adjacent to a restoration project that was approved for funding by CALFED during 1999. Our monitoring program will provide valuable information to the investigators of this and future projects in the region, including estimates of source populations of targeted at-risk species.

Requests for Next-Phase Funding

The proposed monitoring project is the next phase of two ongoing projects previously funded by CALFED. A *summary* of the status of both projects is included as Appendix A.

Previous recipients of CALFED funding

Michael A. Bias, Ph.D., one of the principal investigators for the proposed project, received the initial phase funding from CALFED for both the Tolay Creek Restoration Project (1998#FI-326) and the project titled Cullinan Ranch Tidal Marsh Restoration. Part I: Design, Construction, and Environmental Education (1998#FI-327). See Appendix A for a *summary* of the current status, progress, and accomplishments of these projects to date.

System-Wide Ecosystem Benefits

The proposed monitoring project will provide valuable information about the processes within the San Pablo Bay ecosystem. In addition, the ongoing tidal marsh restoration projects provide potential increased water quality by nutrient removal to the marsh and sediment storage capacity. The restoration of the Tolay Creek tidal action has provided benefits by providing greater aquatic habitat that has increased the numbers of waterbirds using the general area. The tidal restoration projects also supply increased floodplain by breaching levees. The restoration of tidal action will also decrease mosquito breeding habitat. Third party benefits include increased recreational and aesthetic values for 12 million residents of the North Bay.

QUALIFICATIONS

Dr. Reid will serve as Project Manager for this project, with Michael Bias and John Takekawa as co-principal investigators. Dr. Reid will be responsible for all administrative and project management duties, while Drs. Bias and Takekawa will work together to coordinate all activities, equipment and personnel. Technical staff will include a coastal ecologist and an estuarine ecologist, both working closely with Drs. Bias and Takekawa Monitoring will be conducted by technical staff, with Drs. Bias and Takekawa serving as technical leads. The qualifications of each of the principal investigators are detailed below. All staff are available for the duration of the proposed project, and will complete it in a professional and timely manner.

Frederic Arthur Reid

Frederic **A.** Reid, Ph.D. is the Director of Conservation Planning for Ducks Unlimited's Western Regional Office in Rancho Cordova, CA. He has nearly 20 years experience with wetland and waterbird management in North America and selected areas in Europe. Dr. Reid has presented the results of his research in over 45 scientific meetings and 105 wetland management workshops. He has also served as Principal Investigator on more than $3.4 million of research and $11 million of restoration projects. Dr. Reid will serve as Project Manager for this project.

Education

Ph.D. 1989, University of Missouri, Fisheries and Wildlife
M.S. 1983, University of Missouri, Fisheries and Wildlife
B.A. 1978, Hamilton College, Clinton, NY, Biology

Selected Publications

Magee, P.A., F.A. Reid, and L.H. Fredrickson. 1999. Temporarily flooded wetlands of Missouri: Invertebrate ecology and management. Pages 691-710 in D.P. Batzer, R.B. Rader, and **S.A.** Wissinger, eds. Invertebrates in freshwater wetlands of North America: Ecology and management. Van Nostrand Reinhold Company, New York, 1100pp.

Reid, F.A., R.C. Drewien, and T.D. Ratcliff. 1997. Challenges in waterfowl habitat restoration of the Mono Lake Basin. Trans. N.A. Wildl. & Nat. Res. Conf. 62:386-402.

Engilis, **A.** Jr and F.A. Reid. 1997. Challenges in wetland restoration of the western Great Basin. Pages 71-79 in J.M. Reed, N. Wamock and L.W. Oring, eds. Conservation and management of shorebirds in the western Great Basin of North America. Int. Wader Studies 9, 91pp

Michael A. Bias, Ph.D.

Michael A. Bias, Ph.D., is the Senior Restoration Ecologist for ECOW Consulting, Inc. He is the project manager for the Cullinan and Tolay Creek Restoration projects. Dr. Bias's expertise with small mammals makes his technical advice valuable in studying the salt marsh harvest mouse. His doctoral work focused on the ecology of the salt marsh harvest mouse in the San Pablo Bay. His work has focused on wetland and wildlife ecology, small mammals, and salt

Marsh Harvest Mice. Michael A. Bias will serve as co-principal investigator for the project, and will coordinate all activities, equipment and personnel.

Education

Ph.D. 1994, University of California, Berkeley, CA; Wildland Resource Science
M.S. 1989, Humboldt State University, Arcata, CA; Wildlife Management
B.S. 1984, Unity College, Unity, ME; Wildlife Science

Selected Publications

Bias, M. A. and M. L. Morrison. 1999. Movements and home range of salt marsh harvest mice. The Southwestern Naturalist 44 (3): 348-353.

Bias, M. A. and J. M. Payne. 1997. Agriculture and wildlife in California's Central Valley; mutually exclusive or win-win? p. 47-57. in: J. Schaack and S.S. Anderson, eds. Water for Agriculture and Wildlife and the Environments, Win-Win Opportunities. Proceedings from the 1996 USCID wetlands seminar. Bismarck, ND, June 27-29,1996. U.S. Committee on Irrigation and Drainage. Denver, CO. 323pp.

Bias, M. A., N. L. Breuner, and M. L. Morrison. 1992. House mice as indicators of marking effects on salt marsh harvest mice. Transactions of the Western Section of The Wildlife Society 28:34-37.

John Y. Takekawa, PhD.

John Y. Takekawa, Ph.D. has been a federal research wildlife biologist for more than 13 years, and is now with the Biological Resources Division of U. S. Geological Survey (BRD, Vallejo). Dr. Takekawa's research specialty is the ecology of migratory waterbirds. His studies have focused on the Pacific Rim, California and San Francisco Bay. He established the San Francisco Bay Estuary Field Station located on San Pablo Bay in 1995. John Takekawa will serve as co-principal investigator for the project, and will coordinate all activities, equipment and personnel.

Education

Ph.D. 1987, Iowa State University, Ames, Iowa; Animal Ecology, Statistics minor
M.S. 1982, University of Idaho, Moscow, Idaho; Wildlife Resources
B.S. 1979, University of Washington, Seattle, Washington; Wildlife Science/Forestry

Selected Publications

Hui, C. A., J. Y. Takekawa, V. V. Baranyuk, and K. V. Litvin. 1998. Trace element concentrations in two subpopulations of Lesser Snow Geese from Wrangel Island, Russia. Arch. Environ. Contam. Toxicol. 34:197-203.

Kuznetsov, S. B, V. V. Baranyuk, and J. Y. Takekawa 1998. Lack of genetic differentiation between wintering populations of lesser snow geese from Wrangel Island, Russia. Auk. 115:00-00. *(In press)*.

J. Y. Takekawa and N. Wamock. 1998. The Long-billed Dowitcher (*Limnodromous scolopaceus*). Birds of North America. ***(In press).***

COST

Budget

We are requesting a total of $593,931 to support three years of ecological monitoring for the Tolay Creek and Cullinan Ranch restoration projects (Table 2). These projects were partially funded by CALFED through the construction phase (#1998FI326 and #1998FI327). It is critical that the monitoring phase of these projects receive funding, so that the results of each restoration are documented. Explanation of the proposed costs are provided below.

Salary and Benefits

Dr. Reid of Ducks Unlimited will be responsible for project management (120 direct labor hours, $6143 salary, $3607 benefits per year).

Travel

Travel costs (mileage) will include $3000 per year for each Task 1 and 2.

Supplies

Supplies and expendables ($3000 per year for each Task 1 and 2) include field, office and laboratory supplies, as well as publication costs associated with the production of reports and preparation of presentation materials.

Service Contracts

Dr. Michael Bias, Restoration Ecologist (192 hours each Task 1 and 2 per year), Mr. Thomas Keegan, Fisheries Ecologist (80 hours per year Task 2) and Ms. Sheri Emerson, Coastal Ecologist (384 hours each Task 1 and 2 per year) are available through a service contract to ECORP Consulting, Inc. Dr. Bias is the Project Manager of the Tolay Creek and Cullinan Ranch restoration projects. He is also a regional authority on the ecology of the salt marsh harvest mouse, and will provide scientific expertise in this area. Mr. Keegan has over twenty years of experience with the ecology of fish in the San Francisco Bay - Delta. Ms. Emerson has been working on similar projects in the region with Dr. Bias and is experienced in the identification of coastal vegetation. This contract is limited to salary costs.

The Estuarine Ecologist (960 hours each Task 1 and 2 per year) is available through a service contract to U.S.G.S. Dr. Takekawa established the U.S.G.S. Biological Sciences Division, San Francisco Estuary Field Station, which will serve as a central base for the proposed project, and will share some costs associated with vehicles, facilities and miscellaneous equipment (see *Cost Sharing).*

A topographical survey will be conducted each year ($4000, Task 1). Two aerial photographs will be obtained each year ($6000, Task 2).

Overhead

Ducks Unlimited charges a standard overhead rate of 13.55%, which will be applied to all of the above items. This rate covers such overhead items as rent, phones, office staff, production and other general items.

Equipment (exempt from overhead)

For the first year of monitoring, data loggers, a water analyzer and a current meter will be purchased ($15,000, Task 1). Maintenance ($1500, Task 1) will be required for each year thereafter. All of the biological equipment to complete Task 2 has already been purchased.

Cost-Sharing

No other pertinent funding commitments are in process for this proposal. Cost-sharing contributions from the U. S. Geological Survey include those below:

Cost-share requirement	Cost per year	Total
P.I. John Takekawa	$15,000	$45,000
Vehicles	$2,000	$6,000
Miscellaneous	$1,000	$3,000
Total	**$18,000**	**$54,000**

LOCAL INVOLVEMENT

We anticipate no adverse direct or indirect effects from the proposed monitoring project. This project will take place on the Tolay Creek and Cullinan Ranch units of the San Pablo Bay National Wildlife Refuge. The Refuge is supportive of all activities related to the project. As the proposed monitoring project is the next phase of two ongoing projects, access to the necessary properties has been arranged.

The overall project is coordinated with, and has the support of, the California Department of Fish and Game, U. S. Fish and Wildlife Service, Ducks Unlimited, the Southern Sonorna County Resource Conservation District, and the Save San Francisco Bay Association. The project is compatible with CALFED objectives of habitat restoration of saline emergent wetlands and restoration of habitat for targeted species, such as the California Clapper Rail and Salt Marsh Harvest Mouse.

COMPLIANCE WITH STANDARD TERMS AND CONDITIONS

The applicant will comply with all state and federal standard terms and conditions as contained in Attachments D and E of the 2001 PSP (see attached documents).

THRESHOLD REQUIREMENTS

Please see the attached Environmental Compliance Checklist, Land Use Checklist, and contract forms

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
San Francisco Bay National Wildlife Refuge Complex
P.O. Box 524
Newark, California 94560-0524
(510) 792-0222

March 12, 2000

Dr. Michael Bias
ECORP Consulting, Inc.
2260 Douglas Blvd.
Suite 160
Roseville, CA 95661
(916) 782-9100

Dear Dr. Bias:

Pursuant to your request, this letter authorizes permission to Ducks Unlimited (Western Regional Offiae, 3074 Gold Canal Drive, Sacramento, CA 95670) and their cooperator ECORP Consulting, Inc. to access San Pablo Bay National Wildlife Refuge units for biological monitoring work under continuing wetland restoration and rehabilitation projects. This letter of permission addresses the requirements for applications for CalFed grants. Special use permits uith specific oondtions will be completed following the award of funding and prior to initiation of field work.

Sincerely yours,

Bryan R. Winton

Bryan Winton
Refuge Manager

DUCKS UNLIMITED, INC.
WESTERN REGIONAL OFFICE
3074 Gold Canal Drive
Rancho Cordova California 95670-4116
(916) 852-2000
(916) 852-2200 Fax

DUCKS UNLIMITED INC.

May 15,2000

Clerk of the Board of Supervisors
County of Napa
1195 Third Street, Room 310
Napa, CA 94559

Madam Clerk:

Ducks Unlimited is participating in this year's CALFED Proposal Solicitation Program for Ecosystem Restoration Projects and Programs. As stated,in the Solicitation Package, we are required to notify the clerk of the Board of Supervisors of the county in which our project is located and supply a copy of the proposal.

We are pleased to submit a copy of our proposal titled: "Ecological Monitoring of the Tolay Creek and Cullinan Ranch Tidal Wetland Restoration Projects in the North San Francisco Bay". This proposal requests funds to continue the ecological monitoring program of two on-going tidal restoration projects.

Ecological monitoring will begin upon contract approval (early 2001) and will continue through 2003.

If you have any questions or concerns regarding the CALFED process or the proposed construction project, please feel free to call.

Sincerely,

Fritz A. Reid, Ph.D.
Director of Conservation Planning

DUCKS UNLIMITED, INC.
WESTERN REGIONAL OFFICE
3074 Gold Canal Drive
Rancho Cordova, California 95670-6116
(916) 852-2000
(916) 852-2200 Fax

May 15, *2000*

Clerk of the Board of Supervisors
County of Solano
580 Texas Street
Fairfield, California 94533

Madam Clerk

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Sincerely,

Fritz A. Reid, Ph.D.
Director of Conservation Planning

DUCKS UNLIMITED, INC.
WESTERN REGIONAL OFFICE
3074 Gold Canal Drive
Rancho Cordova, California 95670-6116
(916)852-2000
(916) 852-2200 Fax

May 15,2000

Laney Gerber
Clerk of the Board of Supervisors
County of Sonoma
575 Administrative Drive, Room 100A
Santa Rosa, California 95403

Madam Clerk

Ducks Unlimited is participating in this year's CALFED Proposal Solicitation Program for Ecosystem Restoration Projects and Programs. As stated in the Solicitation Package, we are required to notify the clerk of the Board of Supervisors of the county in which our project is located and supply a copy of the proposal.

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Sincerely,

Fritz A. Reid
Director of Conservation Planning

DUCKS UNLIMITED INC.

DUCKS UNLIMITED, INC.
WESTERN REGIONAL OFFICE
3014 Gold Canal Drive
Rancho Cordova, California **95670-6116**
(916) **852-2000**
(916) **852-2200 Fax**

May 15,2000

Napa County
Conservation, Development and Planning
1195 Third Street, Room 210
Napa, CA 94559

Dear Sirs:

Ducks Unlimited is participating in this year's CALFED Proposal Solicitation Program for Ecosystem Restoration Projects and Programs. As stated in the Solicitation Package, we are required to notify the county in which our project is located and supply a copy of the proposal.

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If you have any questions or concerns regarding the CALFED process or the proposed construction project, please feel free to call.

Sincerely,

Fritz A. Reid, Ph.D.
Director of Conservation Planning

DUCKS UNLIMITED INC.

DUCKS UNLIMITED, INC.
WESTERN REGIONAL OFFICE
3014 Gold Canal Drive
Rancho Cordova, California 95670-6116
(916) 852-2000
(916) 852-2200 Fax

May 15, 2000

Solano County
Department of Environmental Management
Planning Services
601 Texas Street
Fairfield, CA 94533

Dear Sirs:

Ducks Unlimited is participating in this year's CALFED Proposal Solicitation Program for Ecosystem Restoration Projects and Programs. As stated in the Solicitation Package, we are required to notify the county in which our project is located and supply a copy of the proposal.

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Sincerely,

Fritz A. Reid, Ph.D.
Director of Conservation Planning

DUCKS UNLIMITED, INC.
WESTERN REGIONAL OFFICE
3071 Gold Canal Drive
Rancho Cordova, California 95670-6116
(916) 852-2000
(916) 852-2200 Fax

DUCKS UNLIMITED INC.

May 15,2000

Sonoma County
Planning Department
Permit and Resource Management
2550 Ventura Avenue
Santa Rosa, CA 95403

Dear Sirs:

Ducks Unlimited is participating in this year's CALFED Proposal Solicitation Program for Ecosystem Restoration Projects and Programs. As stated in the Solicitation Package, we are required to notify the county in which our project is located and supply a copy of the proposal.

We are pleased to submit a copy of our proposal titled: "Ecological Monitoring of the Tolay Creek and Cullinan Ranch Tidal Wetland Restoration Projects in the North San Francisco Bay". This proposal requests funds to continue the ecological monitoring program of two on-going tidal restoration projects.

Ecological monitoring will begin upon contract approval (early 2001) and will continue through 2003.

If you have any questions or concerns regarding the CALFED process or the proposed construction project, please feel free to call.

Sincerely,

Fritz A. Reid, Ph.D.
Director of Conservation Planning

Environmental Compliance Checklist

All applicants must fill out this Environmental Compliance Checklist. Applications must contain answers to the following questions to be responsive and to be considered for funding. *Failure to answer these questions and include* ***them*** *with the application will result in the avvlication being considered nonresponsive and not considered for funding.*

1. **Do** any **of** the actions included in the proposal require compliance with either the California Environmental Quality Act (CEQA), the National Environmental Policy Act (NEPA), or both?

   ____ YES X **NO**

2. If yon answered yes to # **1,** identify the lead governmental agency for CEQA/NEPA compliance.

   _____
   Lead Agency

3. **If** you answered no to # **1,** explain why CEQA/NEPA compliance **is** not required for the actions in the proposal.

   Research Only

4. If CEQA/NEPA compliance is required, describe how the project will comply with either **or** both **of** these laws. Describe where the project is in the compliance process and the expected date **of** completion.

5. Will the applicant require access across public or private property that the applicant does not own to accomplish the activities in the proposal?

   X* YES ____ NO

   If yes, the applicant must attach written permission for access from the relevant property owner(s). Failure to include written permission for access may result in disqualification **of** the proposal during the review process. Research and monitoring field projects for which specific field locations have not been identified will be required to provide access needs and permission for access with **30** days of notification of approval.

* Activities outlines in proposal are currently ongoing, permission and access from USFWS and CDFG has been secured. LETTER IS ATTACHED

6. Please indicate what permits **or** other approvals may be required **for** the activities contained in **your** proposal. Check **all** boxes that apply.

LOCAL		
Conditional use permit	___	
Variance	___	
Subdivision Map Act approval	___	
Grading permit	___	
General plan amendment	___	
Specific plan approval	___	
Rezone	___	
Williamson Act Contract Cancellation	___	
Other _____ (please specify)		
None required	X	
STATE		
CESA Compliance	X	(CDFG) MOU for monitoring the T&E spp
Streambed alteration permit	___	(CDFG)
CWA § 401 certification	___	(RWQCB)
Coastal development permit	___	(Coastal Commission/BCDC)
Reclamation Board approval	___	
Notification	___	(DPC, BCDC)
Other _____ (please specify)		
None required	___	
FEDERAL		
ESA Consultation	X	(USFWS) Recovery permit for monitoring T&E spp.
Rivers & **Harbors Act** permit	___	(ACOE)
CWA § 404 permit	___	(ACOE)
Other _____ (please specify)		
None required	___	

DPC = Delta Protection Commission
CWA = Clean Water Act
CESA =California Endangered Species Act
USFWS = U S . Fish and Wildlife Service
ACOE = U.S. A m y *Corps* of Engineers

ESA =Endangered Species Act
CDFG = California Department of Fish **and** Game
RWQCB =Regional Water Quality Control Board
BCDC= Bay Conservation and Development Comm.

Land Use Checklist

. All applicants must fill out *this* Land Use Checklist for **their** proposal. Applications must contain answers to the following questions to be responsive and *to* be considered for funding. ***Failure to answer these questions and include them with the application will result in the application being considered nonresponsive and not considered for funding.***

1. Do the actions in the proposal involve physical changes to the land (i.e. grading, planting vegetation, or breeching levees) or restrictions in land use (i.e. conservation easement or placement of land in a wildlife refuge)?

_____ YES X NO

2. **If NO to # 1, explain what type of actions are involved in the proposal (i.e., research only, planning only).**

Research only

3. If YES *to* # **1,** what is the proposed land use change or restriction under the proposal?

4. **If** YES to # **1,** is the land currently under a Williamson Act contract?.

_____ YES _____ **NO**

5. **If YES *to* # 1,** answer the following:

Current land use _____
Current zoning _____
Current general plan designation _____

6. If YES to #1, is the land classified as Prime Farmland, Farmland of Statewide Importance or Unique Farmland **on** the Department of Conservation Important Farmland Maps?

_____ **YES** _____ **NO** _____ **DON'T** KNOW

7. If YES **to** # **1,** how .many acres of land will be subject to physical change **or** land use restrictions under the proposal?

_____

8. If YES **to** # **1,** is the property currently being commercially farmed **or** grazed?

_____ **YES** _____ **NO**

9. If YES to **#8,** what are the number of employees/acre _____
the total number **of** employees _____

10. Will the applicant acquire any interest in land under the proposal (fee title or a conservation easement)?

YES	NO
	X

11. What entity/organization will hold the interest?_____

12. If YES *to* # 10, answer the following:

Total number **of** acres to be acquired under proposal _____
Number of acres to be acquired in fee _____
Number of acres to he subject to conservation easement _____

13. **For** all proposals involving physical changes to the land or restriction in land use, describe what entity or organization will:

manage the property _____

provide operations and maintenance services _____

conduct monitoring _____

14. **For** land acquisitions (fee title **or** easements), will existing water **rights** also be acquired? N/A

YES	NO

15. Does the applicant propose any modifications to the water right or change in the delivery of the water?

YES	NO
	X

16. If YES to # **15,** describe_____

STATE OF CALIFORNIA

NONDISCRIMINATION COMPLIANCE STATEMENT

STD. 19 (REV. 3-95) FSC

COMPANY NAME

Ducks Unlimited. Inc..

The company named above (hereinafter referred to as "prospective contractor") hereby certifies, unless specifically exempted, compliance with Government Code Section 12990 (a-f) and California Code of Regulations, Title 2, Division 4, Chapter 5 in matters relating to reporting requirements and the development, implementation and maintenance of a Nondiscrimination Program. Prospective contractor agrees not to unlawfully discriminate, harass or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, disability (including HIV and AIDS), medical condition (cancer), age, marital status, denial of family and medical care leave and denial of pregnancy disability leave.

CERTIFICATION

I, the official named below, hereby swear that I am duly authorized to legally bind the prospective contractor to the above described certification. I am fully aware that this certification, executed on the date and in the county below, is made under penalty of perjury under the laws of the State of California

OFFICIAL'S NAME: Ronald A. Stromstad

DATE EXECUTED: 5/15/00

EXECUTED IN THE COUNTY OF: Sacramento

PROSPECTIVE CONTRACTOR'S SIGNATURE:

PROSPECTIVE CONTRACTOR'S TITLE: Director of Operations

PROSPECTIVE CONTRACTOR'S LEGAL BUSINESS NAME: Ducks Unlimited, Inc.

APPLICATION FOR FEDERAL ASSISTANCE

OMB Approval No. 0348-0043

2. DATE SUBMITTED	Applicant Identifier
15 May 2000	
3. DATE RECEIVED BY STATE	State Application Identifier
4. DATE RECEIVED BY FEDERAL AGENCY	Federal identifier

1. TYPE OF SUBMISSION
Application ☐ Construction ☐ Non-Construction
Preapplication ☐ Construction ☐ Non-Construction

5. APPLICANT INFORMATION

Legal Name: Ducks Unlimited, Inc.

Organizational Unit: WESTERN REGIONAL OFFICE

Address (give *city, county,* State, *and zip code):* 3074 **Gold** Canal Dr. Rancho Cordova', California95760

Name and telephone number of person to be contacted on matters involving this application *(give area code)*: DR. FRITZ REID 916 852 2400

6. EMPLOYER IDENTIFICATION NUMBER *(EIN):* 13-5643799

7. TYPE OF APPLICANT: *(enter appropriate letter in box)* [N]

A. State — H. Independent School Dist.
8. County — I. State Controlled Institution of Higher Learning
C. Municipal — J. Private University
O. Township — K. Indian Tribe
E. Interstate — L. Individual.
F. Intermunicipal — **M.** Profit Organization
G. Special District — N. Other (Specify) non profit

a. TYPE OF APPLICATION
☐ New ☒ Continuation ☐ Revision

If Revision, enter appropriate letter(s) in box(es) ☐ ☐

A. Increase Award 3. Decrease Award C. increase Duration
D. Decrease Duration Other *(specify):*

9. NAME OF FEDERAL AGENCY:

10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER: XX-XXX

TITLE:

11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT: Ecological Monitoring of Tolay and Cullinan Ranch Tidal Wetland Restorat:i 31 Projects in the North **S.P.** Bay

12. AREAS AFFECTED BY PROJECT *(Cities, Counties, States, etc.):* Sonoma and Solano Counties, CA

13. PROPOSED PROJECT

Start Date	Ending Date
1JAN2001	31DEC2003

14. CONGRESSIONAL DISTRICTS OF

a. Applicant	b. Project
11	1, h.7.

15. ESTIMATED FUNDING

a. Federal	$ 54,000 .00
b. Applicant	$ .00
c. Stale	$ .00
d. Local	$ .00
e. Other	$ 5 .00
f. Program Income	$ 593,931 .00
g. TOTAL	$ 647931 .00

16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS?

a. YES. THIS PREAPPLICATION/APPLICATION **WAS** MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW **ON**

DATE _____

b. No. ☐ PROGRAM IS NOT COVERED BY E. 0.12372
☐ OR PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW

17. IS THE APPLICANT DELINQUENT ON ANY **FEDERAL DEBT?**

☐ Yes **If** "Yes," attach an explanation. ☒ No

18. TO M E BEST OF MY KNOWLEDGE AND BELIEF, ALL DATA IN THIS *APPLICATION/PREAPPLICATION* ARE TRUE AND CORRECT, THE DOCUMENT **HAS** BEEN DULY AUTHORIZED BY THE GOVERNING BODY OF THE APPLICANT AND THE APPLICANT WILL COMPLY **WITH THE ATTACHED ASSURANCES IF THE ASSISTANCE IS AWARDED.**

a. Type Name of Authorized Representative	b. Title	c. Telephone Number
Ronald A. Stromstad	Director of Operations	(916) 852-2000
d. Signature of Authorized Representative		e. Date Signed (916) 852-2200

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Standard Form 424 (Rev. 7-97)
Prescribed by OMB Circular A-102

BUDGET INFORMATION - Non-Construction Programs

OMB Approval No. 0348.0044

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (C)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. CALFED-Year 1		$	$	$206,977	$	$206,977
2. CALFED-Year 2				193,477		193,477
3. CALFED-Year 3				193,477		133,477
4.						
5. Totals		$	$	$ 593,931	$	$ 593,931

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total (5)
	(1) Year 1	(2) Year 2	(3) Year 3	(4)	
a. Personnel	$ 6,143	$ 6,143	$ 6,143	$	$18,429
b. Fringe Benefits	3,607	3,607	3,607		10,821
c. Travel	6,000	6,000	6,000		18,000
d. Equipment	15,000	1,500	1,500		18,000
e. Supplies	6,000	6,000	6,000		18,000
f. Contractual	147,320	147,320	147,320		441,960
g. Construction					
h. Other					
i. Total Direct Charges *(sum of 6a-6h)*	154,070	170,570	170,570		525,210
j. Indirect Charges	22,907	22,907	22,907		65,721
k. TOTALS *[sum of 6i and 6j)*	$ 206,977	$ 193,477	$193,477	$	693,931
7. Program Income	$ 206,977	$193,477	$193,477	$	$593,931

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SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS
8.	$	$	$	$
9.				
10.				
11.				
12. **TOTAL** *(sum of lines 8-11)*	$	$	$	$

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	$ 206,977	$51,745	$51,744	$51,744	$ 51,744
14. Non-Federal					
15. TOTAL *(sum of lines 13and 14)*	$ 206,977	$51,745	$51,744	$51,744	$51,744

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (Years) (b) First	(c) Second	(d) Third	(e) Fourth
16. CALFED-PSP 2001 - Year 2	$ 48,370	$48,369	$ 48,369	$ 48,369
17. CALFED-PSP 2001 - Year 3	48,370	48,369	48,369	48,369
18.				
19.				
20. **TOTAL** *(sum of lines 16-19)*	$ 96,740	$ 96,738	$96,738	$ 96,738

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges:

22. Indirect Charges:

23. Remarks:

ASSURANCES - NON-CONSTRUCTION PROGRAMS

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

NOTE Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the awarding agency. Further, certain Federal awarding agencies may require appiicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, i certify that the applicant:

1. Has the legal authority *to* apply for Federal assistance and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project cost) to ensure proper planning, management and completion of the project described in this appiication.

2. Will give the awarding agency, the Comptrolier General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine ail records, books, papers, or documents related to the award; and will estabiish a proper accounting system in accordance with generaiiy accepted accounting standards or agency directives.

3. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personai or organizational conflict of interest, or personal gain.

4. Will initiate and complete the woik within the applicable time frame after receipt of approvai of the awarding agency.

5. Will comply with the Intergovernmental Personnei Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration *(5* C.F.R. 900, Subpart F).

6. Wil! comply with all Federal Statutes relating to nondiscrimination. These include but are not limited to: (a) Titie Vl of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national .origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, reiating *to* nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Aicohoiism Prevention, Treatment and Rehabiiitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Pubiic Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. 553601 et seq.), as amended, reiating *to* nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (j) the requirements of any other nondiscrimination statute(s) which may apply to the appiication.

7. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.

8. Will comply, as appiicable, with provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

9. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333), regarding labor standards for federally-assisted construction subagreements.

10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is $10,000 or more.

11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).

12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. 551271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.

13. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).

14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.

15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. §§2131 et seq.) pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by this award of assistance.

16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.

17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."

18. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL	TITLE
[signature]	Director of Operations
APPLICANT ORGANIZATION	DATE SUBMITTED
Ducks Unlimited, Inc.	5/15/00

U.S. Department of the Interior

Certifications Regarding Debarment, Suspension and Other Responsibility Matters, Drug-Free Workplace Requirements and Lobbying

Persons signing this form should refer to the regulations referenced below for complete instructions:

Certification Regarding Debarment, Suspension. and Other Responsibility Matters - Primary Covered Transactions - The prospective primary participant further agrees by submitting this proposal that it will include the clause titled, "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion -Lower Tier Covered Transaction;' provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions. See below for language to be used; use this form for certification and sign; or use Department *of* the Interior Form 1954 [DI-19541. (See Appendix A of Subpart D of 43 CFR Part 12.)

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions - (See Appendix B of Subpart D of 43 CFR Part 12.)

Certification Regarding Drug-Free Workplace Requirements - Alternate 1. [Grantees Other Than Individuals) and Alternate II. [Grantees Who are Individuals) - [See Appendix C of Subpart D of 43 CFR Part 12.)

Signature on this form provides for compliance with certification requirements under 43 CFR Parts *12* and 18. The certifications shall be treated as a material representation of fact upon which reliance will be placed when the Department of the Interior determines to award the covered transaction, grant, cooperative agreement or loan.

PART A: Certification Regarding Debarment, Suspension, and Other Responsibility Matters - Primary Covered Transactions

CHECK __ IF THIS CERTIFICATION IS FOR A PRIMARY COVERED TRANSACTION AND IS APPLICABLE.

(1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

(a) Are not presently debarred, suspended, proposed for debarment. declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

(b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public [Federal. Stare or local) transaction or contract under a public transaction: violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery. falsification or destruction of records, making false statements, or receiving stolen property:

(c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the dffenses enumerated in paragraph (1)(b) of this certification; and

Id) Have not within a three-year period preceding this appiicationlproposal had one or more public transactions (Federal, State or local) terminated for cause or default.

(2) Where the prospective primary participant is unable to certify to any of the statements in this certification. such prospective participant shall attach an explanation to this proposal.

PART B: Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions

CHECK __ IF THIS CERTIFICATION IS FOR A LOWER TIER COVERED TRANSACTION AND IS APPLICABLE.

(1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency,

(2) Where the prospective lower tier participant is unable to certify to any of the statements in this certificarion, such prospective participant shall attach an explanation to this proposal.

DI-2010
March 1995
(This *form* consolidates DI-1953, D1.1954, DI-1955. 01.1956 and DI-1963)

PART C: Certification Regarding Drug-Free Workplace Requirements

CHECK __ IF THIS CERTIFICATION IS FOR AN APPLICANT WHO IS NOT AN INDIVIDUAL.

Alternate I. (Grantees Other Than Individuals)

A. The grantee certifies that it will or continue to provide a drug-free workplace by:

(a) Publishing a statement notifying employees that the unlawfui manufacture, distribution. dispensing. possession, or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;

(b) Establishing an ongoing drug-free awareness program to inform employees about--
(1) The dangers of drug abuse in the workplace:
(2) The grantee's policy of maintaining a drug-free workplace;
(3) Any available drug counseling. rehabilitation. and employee assistance programs: and
(4) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace:

(c) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the' statement required by paragraph (a);

(d) Notifying the employee in the statement required by paragraph (a) that, as a condition of employment under the grant, the employee wili --
(1) Abide by the terms of the statement; and
(2) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction:

(e) Notifying the agency in writing, within ten calendar days after receiving notice under subparagraph (d)(2) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grant officer on whose grant activity the convicted employee was working, unless the Federal agency has designated a central point for the receipt of such notices. Notice shall include the identification number(s) of each affected grant;

(f) Taking one of the following actions, within *30* calendar days of receiving notice under subparagraph (d)(2), with respect to any employee who is so convicted --
(1) Taking appropriate personnel action against such an employee. up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or
(2) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency;

(g) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (a), (b), (c), (d), (e) and (f).

B. The grantee may insert in the space provided below the site(s) for the performance of work done in connection with the specific grant:

Place of Performance (Street address, city, county, state, zip code)

Ducks Unlimited Inc.
3074 Gold Canal Drive
Rancho Cordova, CA 95670

Check __ if there are workplaces on file that are not identified here,

PART D: Certification Regarding Drug-Free Workplace Requirements

CHECK — IF THIS CERTIFICATION IS FOR AN APPLICANT WHO IS AN INDIVIDUAL.

Alternate II. (Grantees Who Are Individuals)

(a) The grantee certifies that, as a condition of the grant, he or she will not engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance in conducting any activity with the grant;

(b) If convicted of a criminal drug offense resulting from a violation occurring during the conduct of any grant activity. he or she will report the conviction, in writing, within 10 calendar days of the conviction, to the grant officer or other designee, unless the Federal agency designates a centrai point for the receipt of such notices. When notice is made to such a central point, it shall include the identification number(s) of each affected grant.

PART E Certification Regarding Lobbying
Certification for Contracts, Grants, Loans, and Cooperative Agreements

CHECK __ IF CERTIFICATION IS FOR THE AWARD OF ANY OF THE FOLLOWING AND THE AMOUNT EXCEEDS $100,000: A FEDERAL GRANT OR COOPERATIVE AGREEMENT. SUBCONTRACT, OR SUBGRANT UNDER THE GRANT OR COOPERATIVE AGREEMENT.

CHECK __ IF CERTIFICATION IS FOR THE AWARD OF A FEDERAL LOAN EXCEEDING THE AMOUNT OF $150,000, OR A SUBGRANT OR SUBCONTRACT EXCEEDING $ 100,000. UNDER THE LOAN.

The undersigned cenifies, to the best of his or her knowledge and belief, that:

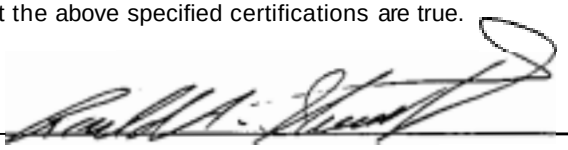
(1) No Federal appropriated funds have been paid or will be paid. by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, and officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement,

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contrac:, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

As the authorized certifying official, I hereby certify that the above specified certifications are true.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL 

TYPED NAME AND TITLE Ronald A. Stromstad, Director of Operations

DATE 5/15/00

DI-2010

March 1995

(This farm consolidates DI-1953. DI-1954, DI-1955. DI-1956 and DI-1963)

Table 1. Work Schedule for Ecological Monitoring at Tolay Creek and Cullinan Ranch

Task Duration	Year **2001** Jan 1 to Dec 31	Year **2002** Jan 1 to Dec 31	Year **2003** Jan 1 to Dec 31
1. Physical conditions			
1.1. Sediments	every 2 months	every 2 months	every 2 months
1.2. Hydrology	every 2 months	every 2 months	every 2 months
1.3. Water Quality	wet/dry season	wet/dry season	wet/dry season.
Topographical Survey	once	once	once
2. Biological variables			
2.1. Vegetation	wet/dry season	wet/dry season	wet/dry season
2.2. Invertebrates	once	once	once
2.3. Fish	wet/dry season	wet/dry season	wet/dry season
2.4. Birds	wet/dry season	wet/dry season	wet/dry season
2.5. Mammals	once	once	once
Aerial Photography	once	once	once
Project Management	weekly meetings quarterly reports annual reports	weekly meetings quarterly reports annual reports	weekly meetings quarterly reports annual reports final report

Table 2. Ecological Monitoring of the Tolay Creek and Cullinan Ranch Tidal Wetland Restoration Pro'ects in the North San Francisco Bay, annual and total budget.

			Subject to Overhead						Exempt from Overhead		
Year	Task	Direct Labor Hours	Salary	Benefits	Travel	Supplies & Expendables	Service Contracts	Overhead (13.55%)	Equipment	Graduate Student Fee Remission	Total Cost
Year 1	Task 1: Physical Monitoring				$3,000	$3,000	$4,000	$1,355	$15,000		$26,355
	Coastal Ecologist	384					$24,960	$3,382			$28,342
	Estuarine Biologist	960					$23,500	$3,184			$26,684
	Restoration Ecologist	192					$16,800	$2,276			$19,076
	Task 2: Biological Monitoring				$3,000	$3,000	$6,000	$1,626			$13,626
	Coastal Ecologist	384					$24,960	$3,382			$28,342
	Estuarine Biologist	960					$23,500	$3,164			$26,684
	Restoration Ecologist	192					$16,800	$2,276			$19,076
	Fisheries Ecologist	80					$6,800	$921			$7,721
	Project Management	120	$6,143	$3,607				$1,321			$11,071
Total Cost Year 1			$6,143	$3,607	$6,000	$6,000	$147,320	$22,907	$15,000	$0	$206,977
Year 2	Task 1: Physical Monitoring				$3,000	$3,000	$4,000	$1,355	$1,500		$12,855
	Coastal Ecologist	384					$24,960	$3,362			$26,342
	Estuarine Biologist	960					$23,500	$3,184			$26,684
	Restoration Ecologist	192					$16,600	$2,276			$19,076
	Task 2: Biological Monitoring				$3,000	$3,000	$6,000	$1,626			$13,626

	Coastal Ecologist	384					$24,960	$3,382			$28,342
	Estuarine Biologist	960					$23,500	$3,184			$26,684
	Restoration Ecologist	192					$16,800	$2,276			$19,076
	Fisheries Ecologist	80					$6,800	$921			$7,721
	Project Management	120	$6,143	$3,607				$1,321			$11,071
otal Cost Year 2			$6,143	$3,607	$6.000	$6.0001	$147,320	$22,907	$1,500	$0	$193,477
Year3	Task 1: Physical Monitoring				$3,000	$3,000	$4,000	$1,355	$1,500		$12,855
	Coastal Ecologist	384					$24,960	$3.382			$28,342
	Estuarine Biologist	960					$23,500	$3,184			$26.684
	Restoration Ecologist	192					$16,800	$2,276			$19,076
	Task 2: Biological Monitoring				$3,000	$3,000	$6,000	$1,626			$13,626
	Coastal Ecologist	384					$24,960	$3.382			$28,342
	Estuarine Biologist	960					$23,500	$3.184			$26,684
	Restoration Ecologist	192					$16,800	$2,276			$19,076
	Fisheries Ecologist	80					$6,800	$921			$7,721
	Project Management	120	$6,143	$3.607,				$1,321			$11,071
otal Cost Year 3			$6,143	$3,607	$6,000	$6,000	$147,320	$22,907	$1,500	$0	$193,477
otal Project Cost			$18,429	$10,821	$18,000	$18,000	$441,960	$68,721	$18,000	$0	$593,931

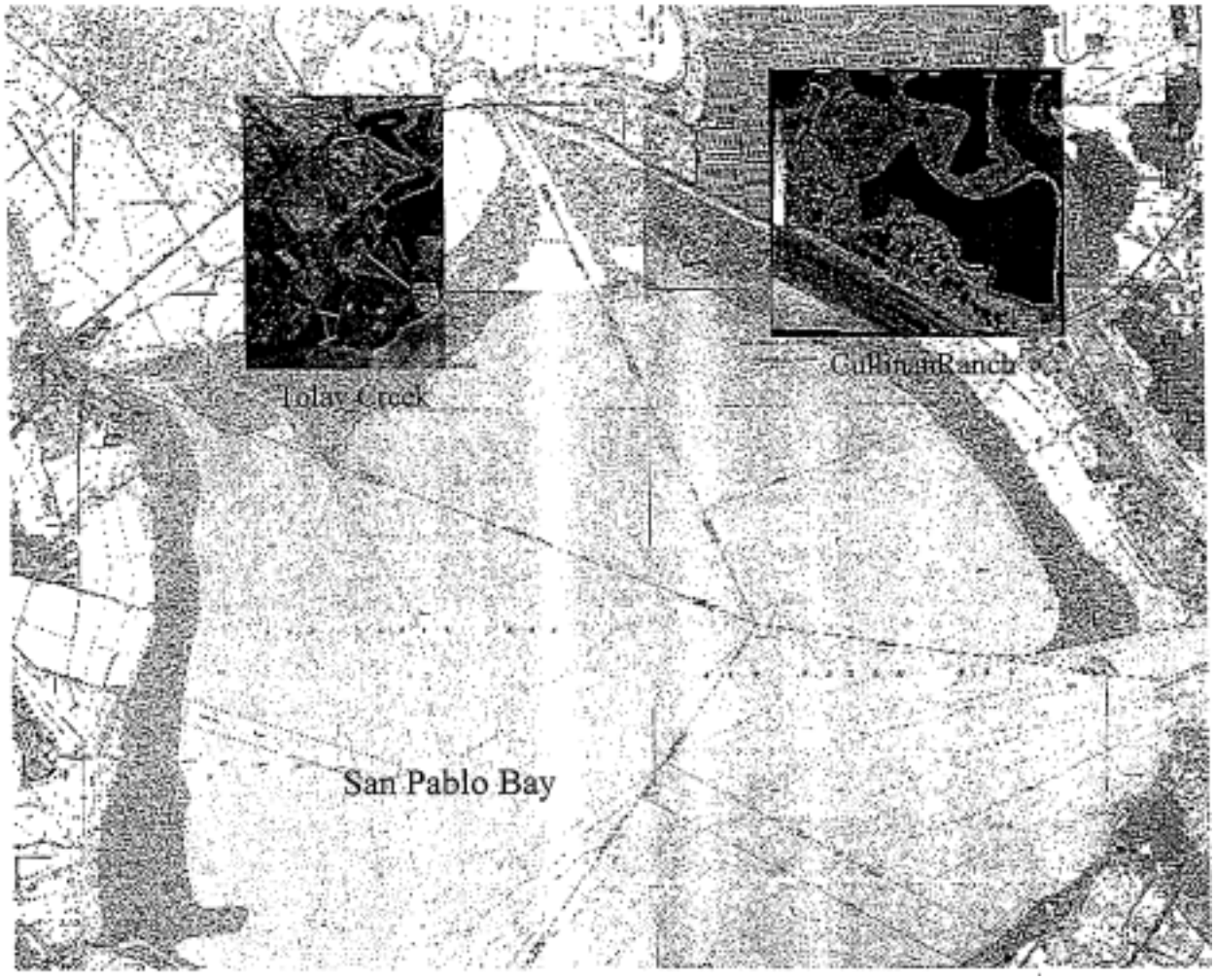


Figure 1. Map of San Pablo Bay with photographic overlays showing the Tolay Creek and Cullinan Ranch projects.

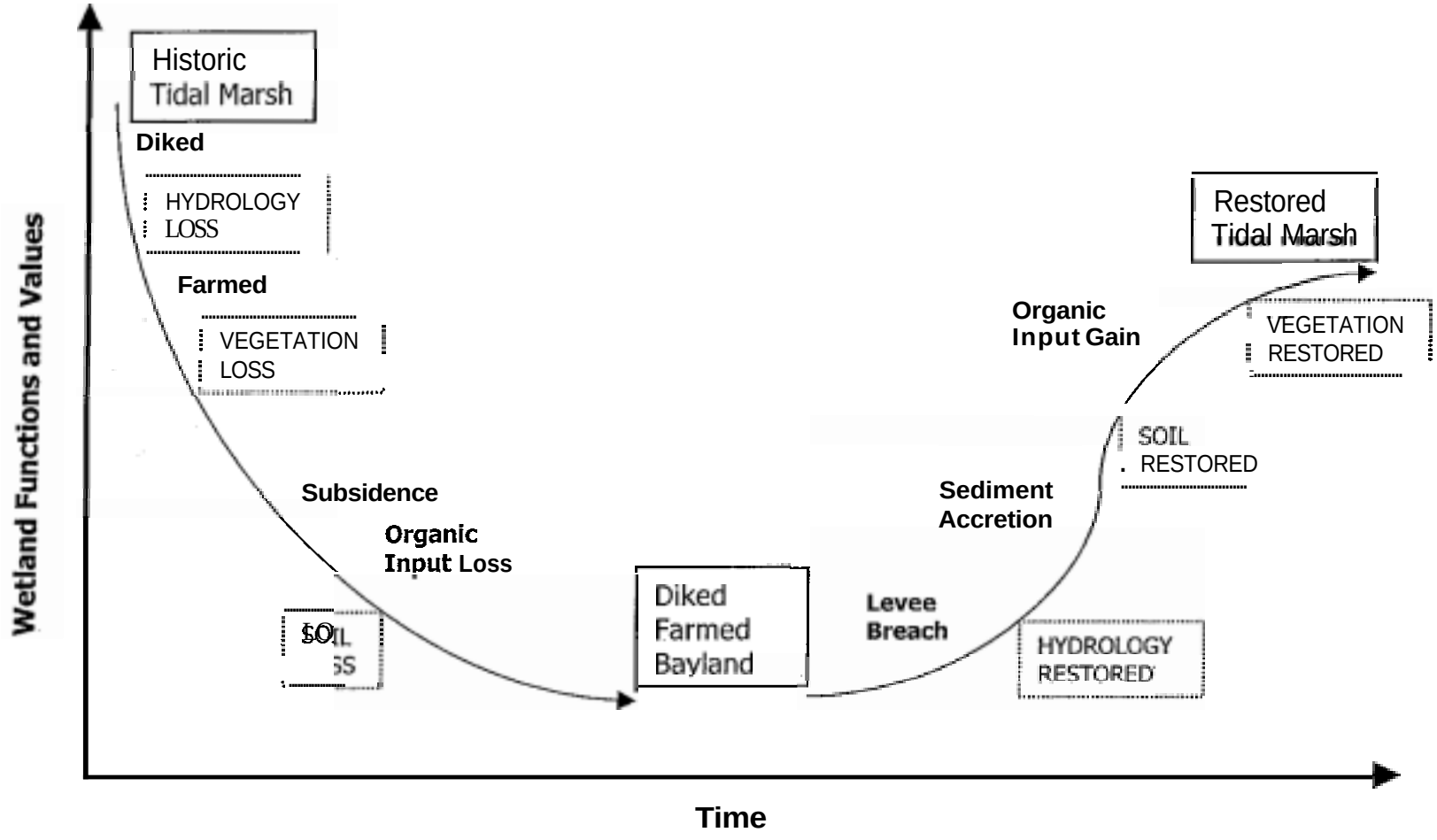


Figure 2. Conceptual model for tidal marsh restoration at Tolay Creek and Cullinan Ranch.

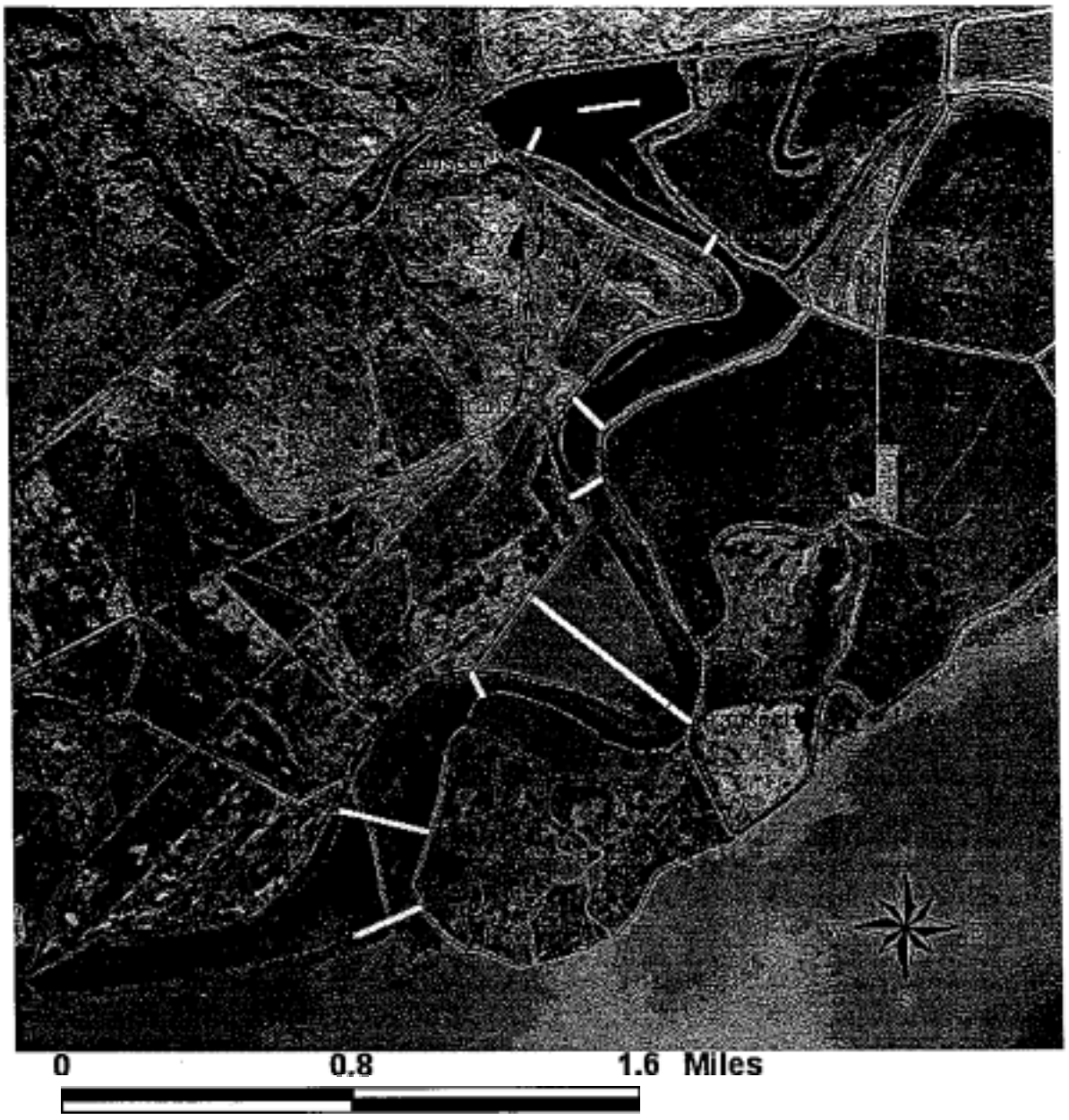


Figure 3. Aerial Photograph of Tolay Creek. Transect locations and numbers are indicated.

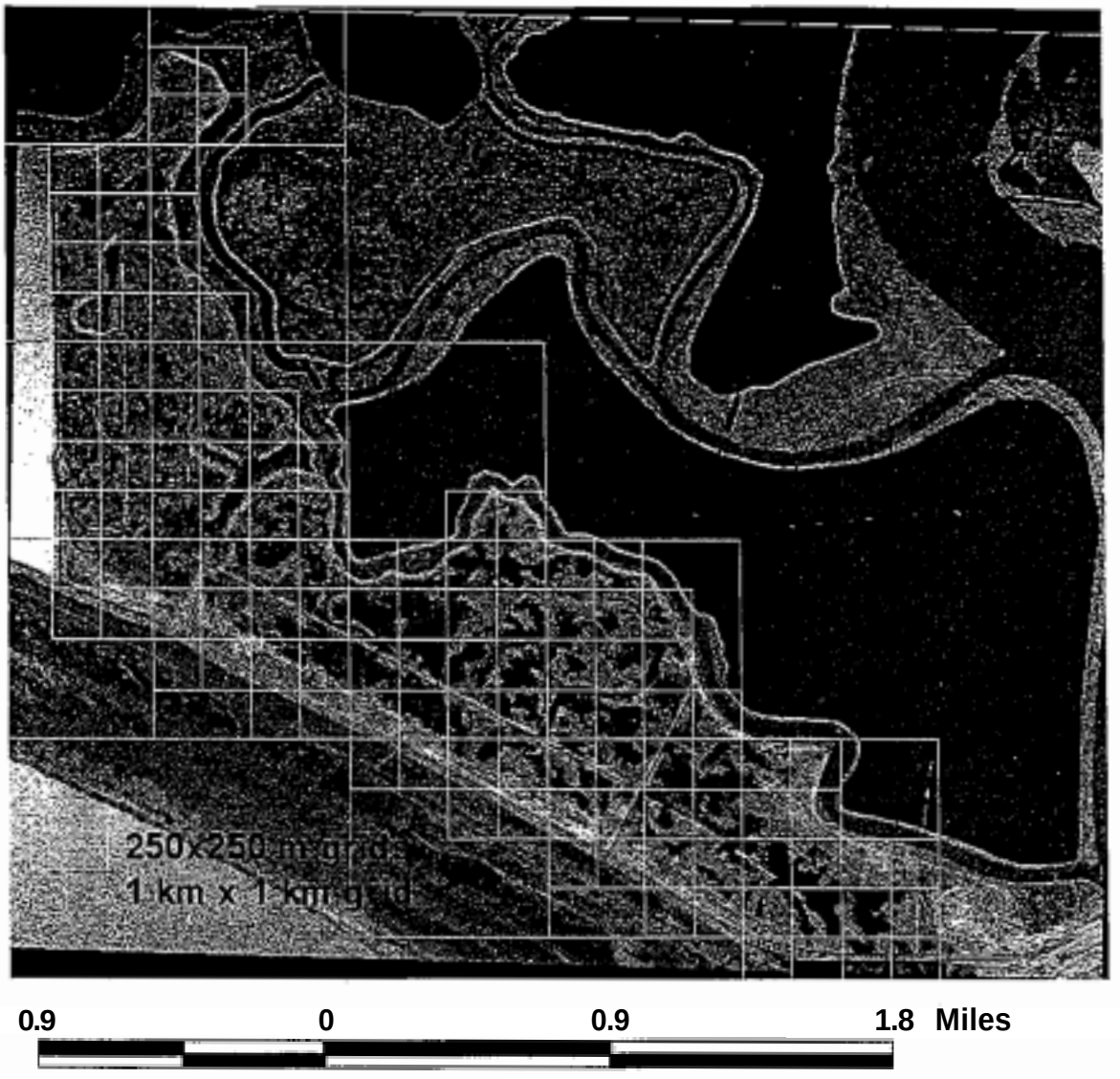


Figure **4.** Framework of sampling grids on Cullinan Ranch. Grids are aligned along Universal Transect Mercator coordinates in 250x250m, 500x500m, and 1,000x1,000m blocks. An example of how the grids overlay is in the circle above.

APPENDIX A. STATUS OF PREVIOUSLY-FUNDED PROJECTS

The proposed monitoring project comprises the Next-Phase of two tidal restoration projects previously funded through construction by CALFED, Tolay Creek (#1998FI-326) and Cullinan Ranch (#1998FI-327). Ecological monitoring was initiated but requires the proposed funds to continue through the next three years. Documentation of environmental change is requisite to the development of adaptive management strategies, and the continuation of ecological monitoring is critical to the success of these projects. The status of each project and the restoration issues involved are summarized below.

Restoring and rehabilitating wetlands in baylands of the San Francisco Bay estuary has become a major goal for resource managers in the region. Wetland projects that are completed in the next few decades will likely establish the landscape of the estuary through the next century. However, wetland restoration in the baylands is relatively new, and few studies have been conducted to examine the restoration process or success of these efforts. Monitoring biophysical characteristics of wetlands is an integral component for applying adaptive management techniques to restoration projects. Establishing habitat characteristics before a project is undertaken, through construction and development, and after project completion provides detailed information to allow for adjustments in projects where intended goals are not being achieved.

In 1998, we established monitoring studies on two wetland projects of the San Pablo Bay National Wildlife Refuge, the Cullinan Ranch restoration (606 ha) and Tolay Creek (176 ha) rehabilitation (Figures 1, 3 and 4). Cullinan Ranch was formerly a large oat-hay field which had subsided as much as 2 meters below sea level. Before construction, Tolay Creek was a degraded wetland with limited tidal exchange, comprised of a narrow wetland strip and shallow pond constricted between levees. We developed methods for sampling biophysical data and to examine spatial and temporal changes in these restoration projects beginning with a baseline dataset including the initial hydrogeomorphology.

At Cullinan Ranch, farming activities and pumping were ended in 1994, and the area rapidly transitioned from an oat-hay field to a diverse seasonal wetland community. We monitored changes in water quality, vegetation, invertebrates, amphibians, birds, and small mammals through the transition. Water quality was relatively uniform across the unit, but the water was highly acidic (pH =3.3) because of oxidation of the peat soils. Ponding of rainwater resulted in a dramatic increase in cattail (*Typha latifolia*) from 0% to 37% in four years. In nocturnal amphibian surveys, we did not detect any red-legged frogs and found only a few Pacific tree frogs. Our large bird surveys and variable circular point counts documented an increase of more than 16 new species of waterbirds in the Cullinan Ranch unit following cessation of pumping. Small mammal trapping resulted in 305 captures in 725 trapnights. Endangered salt marsh harvest mice *(Reithrodontomys raviventris)* represented 5% (11 of 243) of unique individuals captured but were primarily found on the edges and likely represented transient individuals from adjacent marsh fragments. It was difficult to clearly distinguish western harvest mice *(Reithrodontomys megalotis)* from the northern subspecies *(R. r. halicoetes)* of salt marsh harvest mouse with the use of existing morphological keys.

Pre-project data were collected at Tolay Creek restoration in the fall of 1998 to establish a baseline shortly prior to completion of the construction. Baseline data included aerial imagery of the project to capture initial hydrogeomorphology, water quality, vegetative cover, fish, birds, and small mammals. Pickleweed *(Salicornia virginica)* dominated the lower section, while weedy species such as Dock ***(Rumex crispus)*** and Prickly Lettuce *(Lactuca* ***serriola)*** dominated the upper section before rehabilitation. Water quality data showed increasing pH from the edge of the bay to the upper end of the project, reflecting the limited tidal exchange and soil oxidation in the upper reaches. Small mammal trapping resulted in a total of 246 captures in 600 trap nights, and salt marsh harvest mice represented 25.3% (46 of 182) of individuals captured.

Post-project data collection at Tolay Creek was initiated after dredging of the main channel, extensive modifications of existing levees, and addition of a new wetland area along Highway 37 was completed in December 1998. Initial water levels exceeded expectations, resulting in the need for corrective action. We installed tidal dataloggers in the lower, mid, and upper reaches of the project to examine tidal cycles. Low tides were elevated in the upper section, suggesting that flow was constricted. **A** channel was dredged through the lower lagoon in February 1999, and subsequent tidal datum showed improvement. We established measuring pins throughout the project to track sediment accumulation. Periodic readings showed that inundated areas were accumulating new sediment. Flora and fauna surveys were undertaken after construction. The salt marsh was little changed in the lower section, but weedy plants in the upper section were inundated. Small mammal populations in the upper section were temporarily displaced, but bird populations responded quickly to new areas of open water. Overall, the restoration is progressing as planned toward the ultimate goal of developing improved salt marsh habitat.

Continued monitoring will include developing surveys immediately prior to and for 5- years after construction on all restoration projects such as the Cullinan Ranch to support adaptive management. Monitoring at Tolay Creek will extend for at least 4 years to document the improving habitat quality of the salt marsh. Following the initial monitoring periods, long-term monitoring for each project will be transferred from the research program to management within a geographic information system framework. Future research will examine the arrangement and size of salt marshes, salt ponds, and mud flats habitats that best support waterbirds in the estuary. We hope to improve prediction of hydrogeomorphology, plant establishment, and likely fauna colonization of future restorations. Development of food webs in restored areas will be examined, and tests with habitat structures that benefit target species will be conducted. We would like to develop a statistically valid morphometric key for separating salt marsh harvest mice from western harvest mice supported with genetic analyses. Finally, we hope to examine the best methods for controlling nonindigenous invasive species while proceeding with restoration projects.